

Claims:

1. An apparatus for supplying food dough comprising
 - a hopper into which a large block of food dough is supplied,
 - a cutting apparatus located at the lower opening port of the hopper to cut the block into small blocks that have substantially the same volume,
 - a dough feeder having a plurality of rollers that are arranged as a V to form the small blocks into a sheet of the food dough,
 - a transferring conveyor to transfer the small blocks to the dough feeder,
 - a feeding conveyor to convey the sheet of the food dough that is formed by the dough feeder so that it has a constant thickness,
 - a weighing conveyor measuring the weight of a part of the sheet that is conveyed by the feeding conveyor and that is put on the weighing conveyor as the sheet is being conveyed, and
 - a cutting apparatus for cutting the sheet of food dough when the measurement by the weighing conveyor corresponds to a preset value.
2. The apparatus for supplying food dough of claim 1 wherein said weighing conveyor includes first and second weighing conveyors that are serially arranged in the feeding direction, said second weighing conveyor again measuring the part of the sheet of the food dough that is cut out from the sheet after it is measured by the first weighing conveyor, and wherein the timing of the cutting operation of the cutting apparatus is accelerated or delayed when the measurement of the second weighing conveyor does not correspond to the preset value.
3. The apparatus for supplying food dough of claim 1 wherein said weighing conveyor includes first and second weighing conveyors that are serially arranged in the feeding direction, both the first and second weighing conveyors measuring a part of the sheet of the food dough, and wherein the sum of the measurements is compared with the preset value.
4. The apparatus for supplying food dough of claim 3 wherein said second weighing conveyor again measures the part of the sheet of the food dough that is cut out from the sheet after it is measured by the first weighing conveyor, the timing of the cutting operation of the cutting apparatus being accelerated or delayed, when the

measurement of the second weighing conveyor does not correspond to the preset value.

5. The apparatus for supplying food dough of claim 1 further comprising a flour-supplying apparatus located upstream of the feeding conveyor, said flour-supplying apparatus supplying flour onto the feeding surface of the feeding conveyor to prevent the sheet of the food dough that is supplied from the dough feeder from adhering to the feeding surface.

6. The apparatus for supplying food dough of claim 5 further comprising a pair of flour-supplying apparatuses, said pair of the flour-supplying apparatuses being located near side surfaces of the feeding conveyor to supply flour to sides of the sheet of food dough that is supplied by the dough feeder and conveyed by the feeding conveyor.

7. The apparatus for supplying food dough of claim 1 further comprising a flour-supplying apparatus located downstream of the feeding conveyor, said flour-supplying apparatus supplying flour on the upper surface of the sheet of food dough.

8. The apparatus for supplying food dough of claim 5 further comprising an apparatus located downstream of the feeding conveyor to remove flour from the bottom surface of the sheet of food dough that is conveyed by the feeding conveyor.

9. The apparatus for supplying food dough of claim 7 further comprising an apparatus located downstream of the flour-supplying apparatus to remove flour from the upper surface of the sheet of food dough, said flour being supplied by the flour-supplying apparatus.

10. The apparatus for supplying food dough of claim 1 further comprising a photo sensor located near an input port of the dough feeder, said photo sensor monitoring food dough deposited at a given position on the dough feeder, based on the results of which monitoring the feeding speed of the transferring conveyor is controlled to keep constant the input of the food dough from the transferring conveyor.

11. The apparatus for supplying food dough of claim 1 further comprising a photo

sensor located near an output port of the dough feeder, said photo sensor monitoring food dough that is output from the dough feeder and put on the feeding conveyor, based on the results of which monitoring the speed of the output of the dough feeder is controlled to prevent the sheet of the food dough that is output from the dough feeder from being loose.

12. The apparatus for supplying food dough of claim 2 wherein said second weighing conveyor is longer than the first weighing conveyor.

13. The apparatus for supplying food dough of claim 1 wherein the upstream end of the weighing conveyor is arranged at a position that is higher than that of the downstream end of the feeding conveyor, and wherein the cutting apparatus is located between a position where the sheet of the food dough starts to be taken off the feeding conveyor and a position where the sheet of the food dough starts to contact the weighing conveyor.

14. An apparatus for supplying food dough comprising
a hopper to which a large block of food dough is supplied,
a cutting apparatus located at a lower opening port of the hopper to cut the block into small blocks that have substantially the same volume,
a dough feeder having a plurality of rollers that are arranged as a V to form the small blocks into a sheet of the food dough,
a transferring conveyor to transfer the small blocks to the dough feeder,
a feeding conveyor to convey the sheet of the food dough that is formed by the dough feeder to have a constant thickness,
an alignment apparatus to adjust the center of the sheet of the food dough that is conveyed by the feeding conveyor,
a dividing and separating apparatus located downstream of the alignment apparatus to divide the sheet of the food dough in the feeding direction,
weighing conveyors to measure the weight of parts of the sheets that are divided from the sheet and that are put on the weighing conveyors as the sheets are being conveyed, and
cutting apparatuses for cutting the sheets of the food dough when the measurements of the weighing conveyors correspond to a preset value.

15. The apparatus for supplying food dough of claim 14 wherein each weighing conveyor includes first and second weighing conveyors that are serially arranged in the feeding direction, said second weighing conveyor again measuring the part of the sheet of the food dough that is cut out from the sheet after it is measured by the first weighing conveyor, and the timing of the cutting operation of the cutting apparatus being accelerated or delayed when the measurement of the second weighing conveyor does not correspond to the preset value.

16. The apparatus for supplying food dough of claim 14 wherein each weighing conveyor includes first and second weighing conveyors that are serially arranged in the feeding direction, both the first and second weighing conveyors measuring a part of the sheet of the food dough, and wherein the sum of the measurements is compared with the preset value.

17. The apparatus for supplying food dough of claim 15 wherein said second weighing conveyor again measures the part of the sheet of the food dough that is cut out from the sheet after it is measured by the first weighing conveyor, the timing of the cutting operation of the cutting apparatus being accelerated or delayed, when the measurement of the second weighing conveyor does not correspond to the preset value.

18. The apparatus for supplying food dough of claim 14 wherein said dividing and separating apparatus divides the sheet of the food dough into two or more sheets in the feeding direction.

19. The apparatus for supplying food dough of claim 14 further comprising a flour-supplying apparatus located upstream of the feeding conveyor, said flour-supplying apparatus applying flour on the feeding surface of the feeding conveyor to prevent the sheet of the food dough that is supplied from the dough feeder from adhering to the feeding surface.

20. The apparatus for supplying food dough of claim 14 further comprising a pair of flour-supplying apparatuses, said pair of the flour-supplying apparatuses being located near side surfaces of the feeding conveyor to supply flour to the sides of the sheet of the food dough that is supplied by the dough feeder and conveyed by the feeding conveyor.

21. The apparatus for supplying food dough of claim 14 further comprising a flour-supplying apparatus located downstream of the feeding conveyor, said flour-supplying apparatus applying flour on the front surfaces of the sheet of the food dough.

22. The apparatus for supplying food dough of claim 14 further comprising an apparatus located downstream of the feeding conveyor to remove flour from the bottom surface of the sheet of the food dough that is conveyed by the feeding conveyor.

23. The apparatus for supplying food dough of claim 14 further comprising an apparatus located downstream of the flour-supplying apparatus to remove flour from the front surface of the sheet of the food dough, said flour being supplied by the flour-supplying apparatus.

24. The apparatus for supplying food dough of claim 14 further comprising a photo sensor located near an input port of the dough feeder, said photo sensor monitoring food dough deposited at a given position on the dough feeder, based on the results of which monitoring the feeding speed of the transferring conveyor is controlled to keep constant the input of the food dough from the transferring conveyor.

25. The apparatus for supplying food dough of claim 14 further comprising a photo sensor located near an output port of the dough feeder, said photo sensor monitoring food dough that is output from the dough feeder and put on the feeding conveyor, based on the results of which monitoring the outputting speed of the dough feeder is controlled to prevent the food dough that is output from the dough feeder from being loose.

26. The apparatus for supplying food dough of claim 14 wherein said weighing conveyors that are arranged in parallel can approach each other or move apart from each other.

27. The apparatus for supplying food dough of claim 15 wherein said second weighing conveyor is longer than the first weighing conveyor.

28. The apparatus for supplying food dough of claim 14 wherein the upstream end of the weighing conveyor is arranged at a position that is higher than that of the downstream end of the feeding conveyor, and wherein the cutting apparatus is located between a position where the sheet of the food dough starts to be taken off the feeding conveyor and a position where the sheet of the food dough starts to contact the weighing conveyor.

29. A method for supplying food dough comprising of the steps of
forming a block of food dough into a sheet that has a given width and thickness,

supplying the sheet of the food dough to first and second weighing conveyors serially located along the feeding direction for measuring the weight of a part of the sheet,

measuring the weight of a part of the sheet with the first and second weighing conveyors, and

cutting the part of the sheet when the sum of the measurements of the first and second weighing conveyors or the measurement of the second weighing conveyor corresponds to a preset value, with a cutting apparatus being located upstream of the first and second weighing conveyors.

30. A method for supplying food dough comprising of the steps of
forming a block of food dough into a sheet that has a given width and thickness,

supplying the sheet of the food dough to a plurality of first weighing conveyors arranged in parallel, and

cutting a part of the sheet when the sum of the measurements of the first weighing conveyors corresponds to a preset value or when the sheet is supplied to second weighing conveyors arranged in parallel and the sum of the measurements of the first and second weighing conveyors corresponds to the preset value or the sum of the measurements of the second weighing conveyors corresponds to the preset value.

31. An apparatus for supplying food dough having a weighing conveyor for measuring the weight of a sheet of food dough that has a given thickness as it is being conveyed and a cutting apparatus for cutting the sheet of the food dough when the measurement of the weighing conveyor corresponds to a preset value, characterized in

that said weighing conveyor includes first and second weighing conveyor sections that are serially arranged in the feeding direction, in that said second weighing conveyor section again measures the weight of a chunk of food dough that is cut by the cutting apparatus from the sheet, and in that the timing of the cutting operation of the cutting apparatus is accelerated or delayed when the measurement of the second weighing conveyor does not correspond to the preset value.

32. The apparatus for supplying food dough of claim 31 wherein said weighing conveyor includes first and second weighing conveyors that are serially arranged in the feeding direction, both said first and second weighing conveyors measuring a part of the sheet of the food dough, the sum of the measurements of the first and second weighing conveyors being compared with the preset value.

33. The apparatus for supplying food dough of claim 32 wherein said second weighing conveyor again measures the part of the sheet of the food dough that is cut out from the sheet after it is measured by the first weighing conveyor, the timing of the cutting operation of the cutting apparatus being accelerated or delayed, when the measurement of the second weighing conveyor does not correspond to the preset value.

34. The apparatus for supplying food dough of claim 31 wherein said second weighing conveyor is longer than the first weighing conveyor.

35. An apparatus for supplying food dough comprising
a dividing and separating apparatus for dividing a sheet of food dough that has a constant thickness along the feeding direction into narrow sheets and separating them,

a plurality of weighing conveyors arranged in parallel for measuring the weight of the narrow sheets that are divided and that have a constant thickness as they are being conveyed, and

a cutting apparatus for cutting the narrow sheets when the measurements correspond to the preset value.

36. The apparatus for supplying food dough of claim 35 wherein each weighing conveyor includes first and second weighing conveyors that are serially arranged in the feeding direction, said second weighing conveyor again measuring the part of the

sheet of the food dough that is cut out from the sheet after it is measured by the first weighing conveyor, the timing of the cutting operation of the cutting apparatus being accelerated or delayed, when the measurement of the second weighing conveyor does not correspond to the preset value.

37. The apparatus for supplying food dough of claim 35 wherein each weighing conveyor includes first and second weighing conveyors that are serially arranged in the feeding direction, both the first and second weighing conveyors measuring a part of the sheet of the food dough, and wherein the sum of the measurements is compared with the preset value.

38. The apparatus for supplying food dough of claim 37 wherein said second weighing conveyor again measures the part of the sheet of the food dough that is cut out from the sheet after it is measured by the first weighing conveyor, the timing of the cutting operation of the cutting apparatus being accelerated or delayed, when the measurement of the second weighing conveyor does not correspond to the preset value.

39. The apparatus for supplying food dough of claim 35 wherein said dividing and separating apparatus divides the sheet of the food dough in the feeding direction into two or more narrow sheets.

40. The apparatus for supplying food dough of claim 35 wherein said weighing conveyors that are arranged in parallel can approach each other or move apart from each other.

41. The apparatus for supplying food dough of claim 36 wherein said second weighing conveyor is longer than the first weighing conveyor.

42. The apparatus for supplying food dough of claim 35 wherein the upstream end of the weighing conveyor is arranged at a position that is higher than that of the downstream end of the feeding conveyor, and wherein the cutting apparatus is located between a position where the sheet of the food dough starts to be taken off the feeding conveyor and a position where the sheet of the food dough starts to contact the weighing conveyor.